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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,856	07/31/2001	Hirokazu Takeuti	100725-00046	9456

4372 7590 12/05/2002

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EXAMINER	
VALENCIA, DANIEL E	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 12/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/917,856	Applicant(s) TAKEUTI ET AL.	
	Examiner Daniel E Valencia	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-23 and 25-31* is/are rejected.

7)☒ Claim(s) *5,24 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: On page 37, there is no brief description of figure 5(D). In addition, on page 38, the reference to figure 11 should actually be to figures 11(A) and 11(B).

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Inventorship

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the citizenship of each inventor. Specifically, inventors 2, 4, and 6 as ordered in the declaration fails to indicate citizenship.

Claim Objections

Claim 20 is objected to because of the following informalities: The instant claim does not end with a period. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 8, 9, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda U.S. Patent No. 5,790,732. Refer to the appropriate drawings or parts of the specification. Ueda discloses an optical connector with a protective coating with all the limitations of the abovementioned claims. Regarding claim 1, Ueda discloses a preliminary member of an optical device component with optical fiber comprising a long capillary (see fig 1 and 2) tube made of

glass or crystallized glass and an optical fiber inserted and fixed in an inner hole of the long capillary tube (col. 2, lines 18-33), the preliminary will produce, by cutting, a plurality of short capillary tubes with optical fibers each of which composes an optical device component to be connected to an optical connector (see claim 6). Although the reference to does not explicitly state that a plurality of short capillary tubes can be formed from the preliminary member, this would be inherently disclosed in the reference due to the fact that a long preliminary member is used to make a short glass capillary for a connector. Ueda further discloses that the long capillary tube is manufactured by a drawing formation method (see claim 6), as mentioned by instant claims 7 and 13. With reference to claims 8 and 13, Ueda discloses that the long capillary tube comprises a flare portion at an end portion of the inner hole for guiding the optical fiber (5). Ueda discloses that the capillary tube has a mechanical strength, which has been enhanced by creating a compressive stress layer on the surface method (see claim 3), as explained in instant claim 9. Regarding part of claim 13, Ueda discloses that the long capillary tube is filled with curing adhesive and an optical fiber whose covering has been removed (col. 3, lines 35-45) is inserted into the flare portion (col. 4, lines 40-45). Ueda further discloses that the compressive stress layer is formed on the surface of the said long capillary tube by an ion exchanging method (col. 1, line 60 –col. 2, line 10), as described by instant claim 15.

Claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by Severijns U.S. Patent No. 4,698,084. Refer to the appropriate drawings or parts of the specification. Severijns discloses a method of manufacturing a passive fiber optic component with all the limitations of the abovementioned claims. Regarding claim 25, Severijns discloses an optical fiber stub made by a manufacturing method, wherein the optical fiber stub is connected to an optical connector

(col. 2, lines 16-24), the method comprising the steps of: forming a softened glass or crystallized glass into a long capillary tube (col. 7, lines 5-15); inserting and fixing a long optical fiber into an inner hole of the long capillary tube along almost the entire length of an inner hole to manufacture a long capillary tube with optical fiber (col. 7, lines 30-35); cutting the long capillary tube with an optical fiber into a plurality of first capillary tubes with optical fibers each of which has a predetermined length (col. 6, lines 7-15); and polishing end faces of the first capillary tube with optical fiber (col. 7, lines 20-25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4, 6, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda U.S. Patent No. 5,790,732 in view of Severijns. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Regarding claim 14, Ueda discloses a method of using ion exchange to form a compressive stress layer on the outside of the capillary, but does not explicitly state that this can be done using the quenching method. The limitation of claim 14 is a design choice and is a non-critical to the invention. Ueda however; fails to disclose the use of polishing or the thickness of the capillary tube.

On the other hand, Severijns discloses a method of manufacturing a passive fiber optic component that teaches the limitations that the Ueda reference lacks. Regarding claim 2, Severijns discloses that the overall length of the preliminary member is 20mm or more (col. 6, lines 10-15). Although neither Ueda or Severijns explicitly states that the capillary has a linear expansion coefficient less than 7×10^{-6} /K, both references disclose a capillary tube, wherein the tube is made of glass or some material similar in properties to fibers. It is known that fibers have a linear coefficient that is less than 7×10^{-6} /K, therefore this limitation, mentioned in claim 3, is inherently disclosed by the references. Referring to part of claims 4 and 22, Severijns discloses that the long capillary is made of glass about 1mm thick (col. 6, lines20-25) and the optical fiber is fixed in the inner hole of the capillary by an ultra-violet curing adhesive (col. 3, lines 5-23), but the reference does not explicitly state that light of wavelengths 350nm-500nm penetrates the glass capillary at 50%. However, it is known that ultraviolet wavelengths range from about 350 to 500 nm, therefore it would be inherent that at least 50% of ultraviolet (350nm-500nm) would pass through the glass capillary in order to cure the adhesive. Regarding claim 6, although not explicitly stated, it would be inherent that the glass capillary tube would pass at least 30% or more of light within 700 nm-2500 nm; because it would be obvious that such a wider range of wavelengths would pass through the capillary tube due to the transparent properties of glass. Both references disclose methods of making glass ferrules from long glass capillary tubes with a majority of the limitations of the present inventions. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the Ueda and Severijns references to arrive at the present invention.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Sherrer U.S. Patent Application No. 2001/0055449 A1. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Ueda however; fails to disclose the use of a polygonal external surface for the capillary tube.

On the other hand, Sherrer discloses an optical waveguide ferrule and method of making an optical waveguide ferrule that teaches the limitation that the Ueda reference lacks. Regarding claims 10 and 11, Sherrer's disclosure teaches that the capillary tube can take a polygonal shape (fig 2) or a cylindrical shape with a flat portion (fig 1). Both references optical device components comprising glass capillary tubes for optical fibers. Sherrer teaches that it is advantageous to use polygonal shapes because it facilitates fabrication (paragraph 27). Although Sherrer discloses two chip carriers, rather than one tube, the two chip carriers perform the same function; therefore making it advantageous to use a polygonal shape in a device that uses a single tube or two chip carriers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polygonal shape for the tube of Ueda.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Andersen U.S. Patent No. 6,190,055. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Ueda however; fails to disclose the use of this type of glass capillary member for an optical fixed attenuator.

On the other hand, Andersen discloses an optical assembly that teaches the limitations that the Ueda reference fails to mention. Regarding claim 12, Andersen discloses a preliminary member with a majority of the limitations of claim 1, wherein the optical device component is a component for an optical fixed attenuator and the optical fiber has a predetermined attenuation factor (col. 1, lines 5-15). Although Anderson does not explicitly state that the fiber has a constant attenuation factor, it is well known that most fibers have a constant attenuation factor. Both Anderson and Ueda disclose methods of making glass capillary for bare fibers, wherein the components become part of optical devices. One of ordinary skill in the art would be motivated to combine the teachings and suggestions of both references. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the component disclosed in Ueda in affixed optical attenuator.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Fukijawa U.S. Patent No. 4,988,161. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Ueda however; fails to disclose the use of corrosion for fabricating the flared portion of the capillary tube.

On the other hand, Fukijawa discloses an optical fiber fixing method that teaches the limitations of the present claims. Regarding claims 16 and 17, Fukijawa discloses that the conical flare portion of the glass capillary tube is formed by corrosive solution (col. 1, lines 45-55), while protecting the outer surface of the long capillary tube (col. 2, lines 45-46), and wherein the disclosure depicts that the front end has an angle of 45-120 ° (fig 1B). Although the

reference does not explicitly state that a rotating tool is used in this process, this is a design choice that is non-critical to the present invention. Both Ueda and Fukijawa references disclose method of treating glass capillary tubes for fiber insertion and use in connectors. Further, Fukijawa teaches that it is advantageous to use corrosive solution as a means of forming a flared portion in a glass tube (col. 1, lines 45-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use corrosive solution to form the flared portion of the capillary tube disclosed by Ueda.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Omiya U.S. Patent No. 6,450,696. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Ueda however; fails to disclose the type of configuration described by instant claim 18.

On the other hand, Omiya discloses an optical connector ferrule that teaches the type of configuration that the Ueda reference fails to mention. Regarding claim 18, Omiya discloses a method of manufacturing a preliminary member of an optical device component with optical fiber, wherein the flare portion is fitted to the end portion of the long capillary tube by butting the end portion of the long capillary tube and one end of a capillary tube having a substantially conical flare portion at the other end thereof with each other in a split sleeve to align the inner hole of the long capillary tube and an inner hole of the capillary tube with each other (see fig 3). Both references teach the method of manufacturing glass capillary tubes for optical connector devices. Further, Omiya teaches that this configuration is advantageous, because it allows for

the bare fibers disposed in the capillaries to be aligned (col. 10, lines 5-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form this type of configuration with different tubes in the device disclosed by Ueda.

Claims 19-21 and 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda U.S. Patent No. 5,790,732 in view of Matsuura U.S. Patent No. 5,187,762. Refer to the appropriate drawings or parts of the specification. Ueda as applied above, discloses an optical connector with protective coating with a majority of the claimed limitations of the present invention. Ueda however; fails to disclose the use of heat curing.

On the other hand, Matsuura discloses an optical ferrule that teaches the limitations that the Ueda reference lacks (fig. 3). Regarding claim 19, Matsuura discloses that an adhesive heap (21) is formed when the adhesive is filled into the inner hole of the long capillary tube, the adhesive heap including no air bubbles and fills at least the flare portion (col. 3, lines 13-22). Matsuura further discloses an adhesive heap is supported by a transparent member (14 and 13), and wherein the optical fiber is inserted into the inner hole of the long capillary tube while observing the optical fiber, as mentioned in instant claim 20. Referring to claim 21, cleaning a bare fiber before applying adhesive or polishing is well known in the art. Regarding claim 23, Matsuura discloses a method for manufacturing a preliminary member of an optical device component with optical fiber, wherein heat curing adhesive is filled in the inner hole of the long capillary tube, and wherein after inserting a long optical fiber whose covering has been removed

into the inner hole of the long capillary tube through the flare portion (col. 2, lines 60-bottom), the adhesive is cured by heating, whereby the long optical fiber is fixed in the long capillary tube (col. 3, lines 20-20). Matsuura discloses a similar method of making optical device components as the method disclosed in Ueda. Further, Ueda discloses that it is advantageous to use heat curing as a means of securing the optical fiber in the glass capillary tube. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use heat curing in the method disclosed by Ueda.

Claims 26-29 and 31are rejected under 35 U.S.C. 103(a) as being unpatentable over Severijns. Refer to the appropriate drawings or parts of the specification. Regarding claim 26 and parts of claims 27 and 28, although Severijns does not explicitly state that PC polishing is the method of polishing used in the reference, PC polishing is a design choice and is a non-critical limitation. In addition, Severijn's disclosure depicts that the first capillary (fig 2a-2c) is polished to form an inclined surface, which forms an angle between 0 and 30 degrees (col. 7), with respect to the surface perpendicular to the central axis of the first capillary tube, as described in instant claims 27 and 28. Although Severijns does not explicitly states that the capillary has a linear expansion coefficient less than 7×10^{-6} /K, the reference discloses a capillary tube, wherein the tube is made of glass or some material similar in properties to fibers. It is known that fibers have a linear coefficient that is less than 7×10^{-6} /K, therefore this limitation, mentioned in claim 29, is inherently disclosed by the reference. Referring to part of claim 31, Severijns discloses that the long capillary is made of glass about 1mm thick (col. 6, lines20-25) and the optical fiber is fixed in the inner hole of the capillary by an ultra-violet

curing adhesive (col. 3, lines 5-23), but the reference does not explicitly state that light of wavelengths 350nm-500nm penetrates the glass capillary at 50%. However, it is known that ultraviolet wavelengths range from about 350 to 500 nm, therefore it would be inherent that at least 50% of ultraviolet light (350nm-500nm) would pass through the glass capillary in order to cure the adhesive. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings and suggestions disclosed in Severijns to arrive at the present inventions.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Severijns in view of Ueda. Refer to the appropriate drawings or parts of the specification. Severijns as applied above, discloses a method of manufacturing a passive fiber optic component with a majority of the limitations of the present invention. The reference however; fails to disclose that the compressive stress layer is formed on the surface of the long capillary tube.

On the other hand, Ueda discloses an optical connector with protective coating and method of manufacturing the same that teaches the limitation that the Severijns reference lacks. Specifically regarding claim 30, Ueda discloses that a compressive stress layer is formed on the surface of the long capillary tube by ion exchanging (col. 1, line 55-col. 2, line 5). Ueda teaches that this is a beneficial feature because it allows alkali metal ions to be deposited, thereby increasing the strength of the ferrule. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use ion exchange to form a compressive stress layer.

Allowable Subject Matter

Claims 5, 24, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: As to dependent claim 5, the prior alone or in combination, fails to discloses or render obvious a preliminary member of an optical device component with optical fiber as set forth in claim 1, wherein the long capillary tube is made of crystallized glass which has the specific composition percentages described in the instant claim. For example, Ueda discloses an optical connector with a majority of the limitations of the claim; however, the reference fails to disclose or suggest the specified combination of the claim.

As to dependent claim 24, the prior art alone or in combination fails to disclose or render obvious a method of manufacturing a preliminary member of an optical device component with optical fiber as set forth in claim 13, wherein the long capillary tube is made of crystallized glass which allows at a thickness of 1mm, light having a wavelength of 700nm-2500nm to penetrate therethrough at 30% or more, and wherein an adhering failure to the optical fiber is inspected by irradiating light having a wavelength of 700nm-2500nm to the long capillary tube with optical fiber fixed in the inner hole thereof with the adhesive and observing transmitted light or a transmitted image therethrough. For example, Severijns discloses a method of manufacturing a passive fiber optic component, wherein the bare optical fiber is cured to the glass capillary; however, the reference fails to disclose the steps of observing transmitted light or a transmitted image through after irradiating the capillary, fiber, and adhesive.

As to dependent claim 32, the prior art alone or in combination fails to disclose or render obvious an optical fiber stub as set forth in claim 25, wherein the long capillary tube is made of crystallized glass which allows at a thickness of 1mm, light having a wavelength of 700nm-2500nm to penetrate therethrough at 30% or more, and wherein an adhering failure to the optical fiber is inspected by irradiating light having a wavelength of 700nm-2500nm to the long capillary tube with optical fiber fixed in the inner hole thereof with the adhesive and observing transmitted light or a transmitted image therethrough. For example, Severijns discloses a method of manufacturing a passive fiber optic component, wherein the bare optical fiber is cured to the glass capillary; however, the reference fails to disclose the steps of observing transmitted light or a transmitted image through after irradiating the capillary, fiber, and adhesive.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ueda U.S. Patent No. 5,278,928 discloses an optical fiber connector having a glass ferrule covered by a thin reinforcing layer wherein the ferrules a re made from a long capillary tube cut into a plurality of smaller tubes.

Payne U.S. Patent No. 5,305,413 discloses an optical fiber feed through, wherein the fiber is secured by an adhesive heap without any air bubbles.

Ueda U.S. Patent No. 5,499,310 discloses an optical fiber connector with a sleeve for resiliently fitting an optical fiber thereto, that teaches the same general process of forming a preliminary member as claimed in the instant invention.

Knecht U.S. Patent No. 4,994,134 discloses a method of making a ferrule having enhanced concentricity, wherein the fiber is secured using ultraviolet or heat cured adhesives.

Szostak U.S. Patent No. 4,815,809 discloses a method and apparatus for terminating an optical fiber, wherein polishing is used to angle the end of the fiber and capillary.

Manning U.S. 4,743,084 discloses an optical fiber connector for field application that teaches the general structure of the glass capillary in the present invention.

Lampert U.S. Patent No. 5,719,977 discloses an optical connector with immovable ferrule that discloses a glass capillary ferrule used in a connector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel E Valencia whose telephone number is (703)-305-4399. The examiner can normally be reached on Monday-Friday 9:30-6:00.

The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7724 for regular communications and (703)-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

DV

Dan Valencia
December 4, 2002

John D. Lee